Remarks

Entry of the amendments, reconsideration of the application, as amended, and allowance of all pending claims are respectfully requested. Claims 25-28 and 53-71 remain pending.

In accordance with 37 C.F.R. 1.121(b)(1)(iii) and (c)(1)(ii), a version of the paragraphs and claims with markings to show the changes made is provided on one or more pages separate from the amendment. These pages are appended at the end of the Response.

Applicants respectfully request that FIG. 18 and the specification be amended to correct a typographical error. In particular, $CMI_{(i-2)}$ in STEP 1810 should be $CMI_{(i+2)}$. Support for this change can be found in the specification. Thus, no new matter has been added.

For example, support can be found in the specification on page 47, line 1. At that location, it indicates that $CMI_{(i+2)}$ is to be updated. It is well known that to update a value, it is that value that changes and not another. For instance, to update I by 1, it is conventional to state I=I+1, not I=X+1. The same is true here. To update $CMI_{(i+2)}$, the statement should be $CMI_{(i+2)}=CMI_{(i+2)}...$, and not $CMI_{(i+2)}=CMI_{(i-2)}...$.

In the Office Action dated April 23, 2001, claims 25-28 and 53-71 are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Applicants respectfully, but most strenuously, traverse these rejections for the reasons below.

In one example, it is indicated in the Office Action that claim 25 is rejected under §112, since the preamble states a method for correcting for systematic errors, but the body of the claim does not set forth any limitations defining the method. Applicants respectfully disagree. The preamble of claim 25 recites a method for correcting for systematic errors in the writing of timing patterns on a storage medium by a head of a recording device. The body of the claim includes two elements: detecting one or more circumferential systematic errors; and correcting for the one or more circumferential systematic errors. Thus, the claim does include a step of correcting for circumferential systematic errors, which is consistent with the preamble of the claim. The claim does not recite the specific steps used to correct for the circumferential systematic errors, since applicants believe that the mere fact of detecting and correcting for such errors is new. However, applicants respectfully submit that the claim is fully described and enabled in applicants' specification. Thus, applicants respectfully request that the §112 rejection for claim 25 be withdrawn.

Further, the other claims similarly rejected are also definite for the reasons above, and therefore, the §112

rejections for those claims are also requested to be withdrawn.

In addition to the above, the apparatus claims have be rejected due to the term "adapted". Without acquiescing to this rejection, applicants have deleted that word from the claims. Thus, applicants respectfully request withdrawal of the §112 rejection.

As for the rejection of claim 57, it is stated in the Office Action that the arrangement of elements that enables this function (i.e., systematic errors are eliminated) is missing from the claim. It further states that "...the radial movement is along a straight line." Initially, applicants wish to point out that the radial movement for a rotary actuator is not along a straight line, but is along an arc. When systematic errors are present, then the arc is not matched. However, with the correction of systematic errors, the movement of the head is able to match the arc.

In one aspect of claim 57, applicants recite a head radially positioned by an actuator, the head instructed to write a self-servo timing pattern on the storage medium, wherein systematic errors are eliminated and a trajectory of the self-servo timing pattern matches a trajectory traced out by the head in its radial motion across the storage medium. Thus, applicants recite that the head is instructed to write the self-servo timing pattern in such a manner that the systematic errors are eliminated and a trajectory of the self-servo timing pattern matches the trajectory traced out

by the head in its radial motion across the storage medium. Since the head is instructed to perform this function, applicants do specify an element that enables this function. Therefore, applicants respectfully request withdrawal of the §112 rejection.

In the Office Action dated April 23, 2001, claims 60-62 and 64 are provisionally rejected under the judicial created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 3 of co-pending Application No. 09/145,930. Without acquiescing to this rejection, applicants are filing herewith a Terminal Disclaimer to Obviate the Provisional Double Patenting Rejection Over a Pending Second Application. Thus, applicants respectfully request withdrawal of this rejection.

In addition to the above, claims 25, 26, 53, 54, 57, 58, 60-64 and 66-70 are rejected under 35 U.S.C. 102(e) as being anticipated by Brown et al. (U.S. Patent No. 5,682,274). Applicants respectfully, but most strenuously, traverse this rejection for the reasons below.

One aspect of applicants' invention is directed to detecting and correcting for circumferential systematic errors. These are errors that occur systematically along the track. For example, applicants claim a method for correcting for systematic errors in the writing of timing patterns on a storage medium by a head of a recording device. The method includes, for instance, detecting one or

more circumferential systematic errors, and correcting for the one or more circumferential systematic errors.

Unlike applicants' claimed invention, Brown is not concerned with circumferential systematic errors. There is no description, teaching or suggestion in Brown of detecting circumferential systematic errors or correcting for such circumferential systematic errors. Instead, Brown is directed to radial misregistration.

In particular, although in Brown the heads are circumferentially spaced from one another, the circumferential distance results in a radial misregistration, and not in a circumferential error, as claimed by applicants. In particular, modern recording heads use independent read and write elements which are separated (circumferentially) by a fixed distance between them. When these heads are mounted on a rotary actuator, it results in a radial offset between the read and write elements, which is equal to A x sine (Skew angle), where A is the spacing between the elements. The result is a predictable radial offset with position. Thus, Brown is not at all related to detecting or correcting for circumferential systematic errors. Further, Brown is not related to timing patterns.

For all of the above reasons, applicants respectfully submit that Brown does not anticipate claim 25. Further, for similar reasons, applicants respectfully submit that

Brown does not anticipate the other independent claims rejected by Brown.

The dependent claims are patentable for the same reasons as the independent claims, as well as for their own additional features.

Applicants gratefully acknowledge the indication of allowability of claims 27, 28, 55, 56, 59, 65 and 71, if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph. Applicants respectfully submit that these claims do satisfy §112, and therefore, respectfully request an indication of allowability for these claims.

Should the Examiner still have concerns regarding this application, he is invited to all applicants' attorney at the below listed number.

Respectfully submitted,

Blanche E. Schiller

Blanche E. Schiller
Attorney for Applicants
Registration No. 35,670

Dated: August 23, 2001

HESLIN ROTHENBERG FARLEY & MESITI P.C.
5 Columbia Circle
Albany, New York 12203
Telephone: (518) 452-5600
Facsimile: (518) 452-5579

Version With Markings To Show Changes Made

In the Specification:

The first paragraph on page 47 beginning on line 1 and extending to line 3 has been amended, as follows:

Additionally, CMI_{i+2} is updated as follows, STEP 1810:

$$CMI_{i+2} = CMI_{i[-]\pm 2} - (s_{i+1} \times AC_{i+1}).$$

In the Claims:

Claims 53-59, 66, 68 and 70-71 have been amended as follows:

53. (AMENDED) An apparatus for correcting for systematic errors in the writing of timing patterns on a storage medium by a head of a storage device, said apparatus comprising:

a controlling unit [adapted] to detect one or more circumferential systematic errors; and

said controlling unit [being further adapted] to correct for said one or more circumferential systematic errors.

54. (AMENDED) The apparatus of claim 53, further comprising a computing unit [adapted] to compute an integral

correction value for a time interval, wherein a non-zero integral indicates a circumferential error.

55. (AMENDED) The apparatus of claim 54, wherein said computing unit is [further adapted] to add a random error correction for said time interval to said integral correction value to obtain said integral correction value.

56. (AMENDED) The apparatus of claim 55, wherein said controlling unit is [further adapted] to calculate a target interval for said time interval, using said integral correction value to correct for said one or more circumferential errors.

57. (AMENDED) A storage device comprising:

a storage medium; and

a head radially positioned by an actuator, said head [adapted] instructed to write a self-servo timing pattern on said storage medium, wherein systematic errors are eliminated and [rotation] a trajectory of said self-servo[-] timing pattern matches a trajectory traced out by the head in its radial motion across the storage medium.

58. (AMENDED) The storage device of claim 57, wherein said head is [adapted] to write said self-servo[-] timing pattern such that random errors in a track to track alignment of the self-servo[-] timing patterns are

statistically constant in their root mean square value across at least a desired portion of a surface of the storage medium.

59. (AMENDED) The storage device of claim 57, wherein said head is [adapted] to write said self-servo[-] timing pattern such that random errors in a track to track alignment of the self-servo timing patterns are corrected in a manner that leads to a growth of errors that is less than the square root of the track number typical of a random walk process.

66. (AMENDED) An apparatus for determining systematic time delays in the writing of trigger patterns on a storage medium of a storage device, said apparatus comprising:

a processing unit [adapted] to take a plurality of measurements of at least one trigger pattern at a plurality of radial positions; and

said processing unit [being further adapted] to use said plurality of measurements to determine at least one systematic time delay.

68. (AMENDED) The apparatus of claim 66, wherein said processing unit is [further adapted] to use said at least one systematic time delay to write one or more trigger patterns on said storage medium.

70. (AMENDED) The apparatus of claim 66, further comprising a controlling unit [adapted] to correct at least one systematic time delay.

71. (AMENDED) The apparatus of claim 66, wherein said controlling unit is [further adapted] to correct for random errors in the placement of trigger patterns.